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Letter dated 13 March 2013 from the Permanent Representative of Jordan to the United Nations addressed to the President of the Economic and Social Council

I have the honour to request that the report of the regional preparatory meeting for Western Asia on the theme "Science, technology and innovation for sustainable development" be circulated as a document of the Economic and Social Council for consideration at its 2013 substantive session, under item 2 (b) of the agenda. The meeting was held on 26 November 2012, in Amman, in preparation for the annual ministerial review of the Economic and Social Council.

At the regional preparatory meeting, the challenges of using science, technology and innovation for sustainable development in the region were examined as a contribution to the theme of the 2013 annual ministerial review, "Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the Millennium Development Goals". The Hashemite Kingdom of Jordan believes that the report will constitute a valuable contribution to the discussions in Geneva in July.

(*Signed*) Zeid Ra'ad Zeid **Al-Hussein**
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Annex to the letter dated 13 March 2013 from the Permanent Representative of Jordan to the United Nations addressed to the President of the Economic and Social Council

Report of the Western Asia regional preparatory meeting on science, technology and innovation for sustainable development for the 2013 annual ministerial review of the Economic and Social Council

Summary

In preparation for the 2013 annual ministerial review of the Economic and Social Council, a regional preparatory meeting on the theme "Science, technology and innovation for sustainable development" was held in Amman on 26 November 2012. The meeting was hosted by the Government of Jordan, in cooperation with the Economic and Social Commission for Western Asia (ESCWA) Technology Centre, the Department of Economic and Social Affairs and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The meeting brought together a diverse group of regional stakeholders to discuss the state and present role of scientific research and innovation in Western Asia and North Africa, as well as options for improving policies and incentives for increasing investment in, and benefits from, science, technology and innovation in the region. The meeting consisted of two round-table panel discussions over the course of one afternoon.

The following key policy messages emerged from the discussion:

Building and nurturing innovative societies

- Building and nurturing innovative societies requires commitment from all levels of society, based on the promotion of science, knowledge and openness.
- Governments have a central role to play in encouraging innovation, even if it usually originates in the private or voluntary sectors.
- Policies that encourage adaptation to new challenges and provide incentives to build capacities for innovation should be embraced.
- Policies for innovation should be holistic, ranging from systems to provide basic education and skills to young people to the creation of the necessary enabling environments for investment and opportunities for commercialization.
- A good initial policy step is the adoption of a national innovation strategy and clearer science policies that improve the science, technology and innovation ecosystem by establishing a policy framework for transformative change.

Ensuring that advances in science, technology and innovation are inclusive

- Acquiring global knowledge and technology, adapting it and assimilating it to local contexts has wide multiplier effects, resulting in an environment in which everyone can work to achieve their potential and contribute to society, especially young people and women.

- Open access resources, whether open educational resources, research publications, virtual libraries or open patent information, are important tools for developing solutions to sustainable development challenges. To ensure their effective use, methods for promoting their accessibility in the region, such as translation into other languages and access to the infrastructure needed to support them, will be essential.

- In the current context, in which globalization and technological development reward innovation and dynamic systems, excluding significant segments of the population from participating and contributing to the development of their societies holds back countries' potential and increases social instability.

Improving partnerships within the region and beyond

- Greater efforts towards developing regional cooperation and intraregional partnerships are urgently needed. Many successful partnerships in the region have focused on international linkages with partners from outside the region. Although the region is diverse socio-economically and culturally, there are some common priorities and challenges, as well complementary capacities and needs, which could benefit from collective, regionally driven solutions.

- There are a number of science, technology and innovation "islands of excellence" dispersed throughout the region which could initiate productive partnerships to address regional sustainability challenges. These partnerships should maintain, where necessary, ties to other stakeholders from outside the region, while ensuring that problem-solving reflects regional, not external, priorities.

- Regional stakeholders, particularly universities and research centres, should take advantage of the dramatic increase in large-scale international research collaborations, as the necessary research facilities and staff incur high costs. The subsequent opportunities for knowledge and information exchange would help to subsidize strengthened research networks and promote innovation.

I. Introduction

In July 2013, the Economic and Social Council will hold its seventh annual ministerial review in Geneva. The review will focus on "Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the Millennium Development Goals".

On 26 November 2012, a regional preparatory meeting for the Western Asia region was hosted by the Government of Jordan and the Economic and Social Commission for Western Asia (ESCWA) Technology Centre, in cooperation with the Department of Economic and Social Affairs and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The meeting brought together a diverse group of regional stakeholders and experts from the United Nations system and other international organizations, as well as from non-governmental organizations, academia and the private sector. The participants discussed how national and regional systems for science, technology and innovation could not only improve wages and the quality of life for people in the region but also contribute to more inclusive, sustainable growth and development patterns.

The meeting provided an important opportunity for stakeholders from Arab countries of Western Asia and North Africa to contribute to the annual ministerial review, including by sharing best practices and lessons learned.

II. Proceedings of the regional preparatory meeting

A. Opening session

In his welcoming remarks, Jafar Hassan, Minister of Planning and International Cooperation of Jordan, welcomed the timing of the meeting against the backdrop of the country's drafting of a national strategy on innovation. He outlined the approach Jordan was taking by encouraging innovative partnerships in the education and research sectors, including through the establishment of a new centre for education, innovation and competitiveness. At the same time, he underscored the need to improve the employment environment to ensure that graduates gaining new skills in science and technology could be absorbed successfully by the labour market. He stated that countries in Western Asia could not succeed in the global economy without sharing experiences with one another, and with those outside of the region, in relation to strategies for promoting advances in science, technology and innovation. In that regard, Mr. Hassan welcomed the establishment of the ESCWA Technology Centre, which served to bring actors from the region together — in a venue away from ESCWA headquarters, which the Minister saw as a useful way of connecting the regional and national dimensions — to discuss strategies for using science, technology and innovation for sustainable development.

The Executive Secretary of the Economic and Social Commission for Western Asia (ESCWA) said that technology would have a critical role to play in transitioning to sustainable development patterns in the region, and she noted the importance of science and technology in almost all the recent United Nations resolutions focusing on economic, social and environmental issues. The Arab region

would have to rely on technology for future socio-economic progress, given the importance of knowledge in determining the wealth of nations in the twenty-first century. In that context, several regional realities and priorities should be taken into consideration. First, technology, especially home-grown innovations supported by selected transferred technologies, was needed to increase economic productivity. Second, increased productivity should lead to higher wages and quality of life. Third, harnessing local knowledge and technology, and its wide multiplier effects, would create dignified jobs for the majority of educated young people who were not employed. Next, "islands of competence" dispersed in the Arab world must build productive partnerships to address regional sustainability challenges. Open knowledge sources and innovation products and services should be channelled for socio-economic gains. The youth population would have the chance to "leapfrog" into developing technology tools. Finally, she noted that investing in technology partnerships simply made good business sense, as there were lucrative market opportunities to be developed in solving pressing sustainability problems in the region.

In her opening remarks, the Assistant Director General for Natural Sciences of UNESCO thanked Mr. Hassan for highlighting key science, technology and innovation priorities in the region, for which UNESCO could lend expertise and support. She acknowledged that most of the discussion at the meeting would focus on higher education and research systems, but wanted to remind participants of the fundamental importance of high-quality basic education, especially basic science education, for other aspects of sustainable development, such as health literacy and a basic understanding of the natural environment, among other things. Referring to the theme of the meeting, she focused on two tools lacking in the region that were necessary for progress in science, technology and innovation. First, too few large-scale international science and research collaborations involved actors from the region. This was especially troubling since research collaborations of this type had increased significantly in recent years, contributing to the dispersion of knowledge. Second, she referred to gaps in the "ecosystems" for science, technology and innovation advances in the region, and stated that some basic first steps for addressing them would include better articulated science policies at the national and regional levels and capacity-building projects in science and technology.

Speaking on behalf of Desra Percaya (Indonesia), Vice-President of the Economic and Social Council, the Director of the Office for Economic and Social Council Support and Coordination, Department of Economic and Social Affairs, highlighted the historical role played by science and techno' gy in solving the problems of past eras and its role in addressing future global challenges. He stated that, given the current state of science, technology and innovation in Western Asia, it was uncertain how much the region would be able to contribute to solving those challenges. For instance, spending on scientific research and development was significantly below the global average. If the level of spending did not change, not only would voices from the region be left out of global problem-solving, Western Asia would also struggle with its limited capacities to address local challenges that might be overlooked by the international community. Therefore, Governments needed to get the incentives right, starting with the skills developed in the early educational years and continuing through to the creation of the necessary enabling environments for investment and innovation in the private sector. He concluded by emphasizing the role of the Council in partnering with national and regional actors

to pursue joint strategies for using science, technology and innovation for sustainable development.

B. Roundtable discussion I: enabling productive capacities in science, technology and innovation in Western Asia

Lahcen Daoudi, Minister of Higher Education, Scientific Research and Executive Training of Morocco, who chaired the roundtable discussion, warned that only the strongest would prevail in the current hypercompetitive global economy. For countries in the region to compete, gross expenditure on research and development would need to increase dramatically. He identified a few areas for immediate improvement. First, universities in the region needed to become better hubs for scientific and technological development, as well as for innovation. For example, why not develop programmes that focused on successful technology transfer opportunities in university departments and research centres? Even more importantly, higher education systems in the region needed to be reoriented more strategically towards future investment opportunities and high-growth sectors. Second, exports from the region were not value-added products, and it was difficult to see how countries in the region could grow sustainably if that did not change. Next, the brain drain of researchers and budding entrepreneurs continued to hinder the development potential of the Arab countries. Fourth, actors in the region should put just as much energy into strengthening intraregional networks as they did into linking with partners in Europe and North America. While linkages between local and foreign universities had resulted in some innovative education partnerships, too few ties — through research partnerships and/or education exchanges — bound together universities within the region. This was problematic, as the region did have some common priorities which could benefit from collective, locally based problem-solving. One option for encouraging stronger regional partnerships could be a common Arab fund for intraregional research collaborations on local sustainable development challenges.

The Assistant Director General for Natural Sciences of UNESCO delivered the keynote address at the meeting, which served as the basis for the first roundtable discussion. After listening to some of the initial comments made by speakers, she posed two questions to the participants. In her view, the answers to those questions would help to solve some of the critical weaknesses in science, technology and innovation in the region. First, she asked whether it was possible for regional actors to take advantage of developments in science, technology and innovation in order to bypass intermediary steps in technological development. This possibility took on new importance given growing global trends in science, technology and innovation: the democratization of science; new dynamics of international cooperation on scientific projects; increases in interdisciplinary, team-based research collaborations; and the unexplored potential of big data. Second, she proposed to the participants that when discussing the present theme, it should be recognized that scientific enterprise would not thrive in environments in which other forms of free expression were restricted. Therefore, discussions about innovative societies needed to take into consideration how features of the wider social and political environment did or didn't encourage innovation.

Mouin Hamze, Secretary-General of the National Council for Scientific Research of Lebanon, reminded participants that it was important to acknowledge

the successes in science, technology and innovation in the region, rather than focusing exclusively on shortcomings. For example, national commitments to investing in education had improved dramatically, with consequent increases in the enrolment rates of girls and the general educational attainment of societies. With regard to research systems in the region, he noted the dramatic increase in multidisciplinary research approaches and projects that had the potential to result in innovative solutions to development challenges. Although there were a number of successes worth noting, he also identified opportunities for improvement in the region. For example, regional cooperation was one area in which Western Asia was lacking. Although countries in the region often partnered on various projects, they were usually financed and administered through outside intermediaries, such as the European Union, and as a result could reflect external rather than regional needs. Considering the advanced economic status of some countries in Western Asia, there could be options to think in terms of stronger local and regional partnerships. Mr. Hamze was also concerned that, relative to other countries, the production of knowledge in the region was much more easily achieved than the implementation of knowledge. The relationship between research and higher education systems needed to be re-examined, as too much research undertaken in the region was linked neither to innovation nor problem-solving on sustainable development challenges. At the same time, he acknowledged that prioritization of issues for research was necessary but difficult, given the diversity of emerging challenges faced by the region.

Rana Zayadin, Executive Director of Outreach of the Royal Scientific Society of Jordan, made a statement on behalf of Sumaya Bint El Hassan, the President of the Society. She highlighted a few critical challenges to science, technology and innovation advancement in Jordan. First, most small and medium-sized enterprises in Western Asia — over 95 per cent — were actually micro-enterprises, making it very difficult for entrepreneurs to take risks that might drive innovation. As the result of their small size and limited resources, many of the enterprises had limited knowledge of the standards within their sector, without which innovation was unlikely to occur. Ms. Zayadin suggested that the region might have more to offer in innovations occurring outside of the science and technology sectors.

Saif Abdullah Al Haddabi, Assistant-Secretary-General for Scientific Programmes and Research of the Research Council of Oman, discussed the importance of technology transfer for successful scientific collaboration. He stated that there was still a lot to be learned from the large data sets being generated by new technologies, which could be better exploited by researchers to promote innovation in the region. He pointed out that capacities were also underdeveloped, with a particular need for improved financial capacities and funding opportunities. In line with the previous speaker, he ended his comments by noting that innovation needed to be better defined and, perhaps, expanded to non-technological innovations occurring in the region, which could be scaled up or commercialized.

The Executive Director of the ESCWA Technology Centre, who moderated the first roundtable discussion, suggested that the panellists consider several key elements that had been raised thus far by other speakers. First, he asked how cultures of innovation or science could be encouraged in countries in the region. Second, he wondered if the panellists would address the ways in which researchers and funders could successfully prioritize research needs, given the wide range of questions and challenges deserving attention. What kind of science did regional actors want to promote: science and technology for commercial development and

applications, or science and technology for problem-solving? He noted that they were not mutually exclusive. Finally, he recommended that the panellists consider the extent to which local contexts could absorb capacities and the steps needed for improving their potential to do so.

During the interactive discussion that followed the roundtable discussion, participants asked a number of questions. Several participants said that innovation would not flourish in the region unless science was more widely respected and played a bigger role as an essential tool within societies. In countries in the region where that was not the case, many people with bright ideas relocated elsewhere. The Assistant Director General for Natural Sciences of UNESCO suggested that Governments could commit to a regional science, technology and innovation policy as one practical concrete step towards more innovative societies. Mr. Al Haddabi suggested that innovation could be discussed endlessly, but what was really missing was a frank discussion using different indicators on ways that countries successfully pursue sustainable development strategies. Regarding national investment in research and development, participants questioned whether there was a standard percentage of gross domestic product (GDP) which had been shown to have a causal effect on increases in innovation.

There was also a discussion of ways in which trust between academia and industry could be enhanced to encourage more innovative partnerships, as in Europe and North America. One participant asked how universities could have a greater impact; while an increase in publications could be beneficial for researchers in the region, publications alone did not lead to innovation. Another participant suggested that faculty tenure systems at universities could adapt to take into consideration such achievements as patents and professional consulting, rather than publications alone.

It was widely agreed that to encourage reform processes to educational, research and funding systems, incentives would need to change. Such a step required government commitment. For example, one participant asked if funding sources could not require the formation of intraregional partnerships as part of their criteria. Another participant noted a subtle change in young people's attitudes towards local challenges and contexts since the Arab Spring, stating that at universities and in small and medium-sized enterprises there was a greater drive among young people to take on local problems.

C. Roundtable discussion II: harnessing global knowledge and technologies for regional sustainable development initiatives

The Chief of the Science and Technology Section of the United Nations Conference on Trade and Development (UNCTAD) provided an overview of two essential tools for harnessing global knowledge for initiatives in the region: open access resources, especially publications and research articles, and virtual science libraries. They were part of the larger phenomenon of increasingly available open educational resources. She pointed out that the number of open access resources had increased dramatically in recent decades, in large part as a result of changing institutional mandates and national norms and regulations. Some of the primary benefits of open access included: improving the speed, efficiency and efficacy of research; enabling interdisciplinary research; increasing impact, especially by

researchers from developing countries; and knowledge dissemination to stakeholders outside of academia. Virtual science libraries were also helping to facilitate access to knowledge to potential users from outside of academia. One of the challenges the systems faced, however, included the current academic reward system, which privileged journals from Europe and North America, often to the detriment of researchers working outside those regions. Second, the sheer amount of information sometimes prevented potential users from finding the appropriate material. Finally, the financial sustainability of many virtual spaces was often uncertain and built on short-term funding processes. The Economic and Social Council could consider encouraging stronger commitments to such resources to ensure their accessibility and financial sustainability, as well as promoting an increase in research and educational networks to pool resources.

The Strategic Planning Officer of the United Nations Industrial Development Organization (UNIDO) focused his remarks and presentation on knowledge networks, which he defined as a group of interconnected actors with a common interest in knowledge acquisition. He said that networks were crucial for information exchange and knowledge creation and diffusion, and that they contributed significantly to knowledge management. The newest models of cooperation via networks went beyond traditional government actors; instead, today's most successful networks were increasingly adapting distinct forms of governance, with the aim of linking different types of public and private actors within and across organizational and national boundaries. Given the increasing choice of networks and the importance of seriously investing in some networks and institutionalizing network ties, it was necessary to develop clear networking strategies with clear objectives. He concluded by noting that networks could be essential to the implementation framework of the post-2015 development agenda. Mapping existing and emerging networks, some of which UNIDO had done, would be a useful exercise in that regard.

The moderator for the second roundtable discussion, the Director of the Office for Economic and Social Council Support and Coordination, opened the discussion by asking the panellists to consider two questions. First, how could global knowledge be harnessed for regional initiatives on the next wave of development challenges such as food security, sustainable energy, water access and urbanization? Second, what were the greatest opportunities for forming new partnerships involving non-governmental actors in the region?

Mohammed Ahmed Al Amer, President of the Central Informatics Organization of Bahrain, noted the exciting potential of open educational resources while questioning how accessible and inclusive most of the tools actually were for users in the region (for example, owing to language barriers, content not suited to local contexts, and the like). Referring to earlier discussions at the meeting, he emphasized the importance of networks and the rapidly increasing opportunities for developing them within the region and beyond, with unlimited potential for expanding and deepening the learning environment in particular.

Salim Alruzaigi, Chief Executive Officer of the Information Technology Authority of Oman, echoed earlier comments by acknowledging the dramatic increase in knowledge and information production and sharing, but questioned whether the region was taking full advantage of those developments. Another issue that had received less attention was the process of modifying global knowledge so

that it could be used effectively in local contexts. He described a three-stage process for translating knowledge from global to local, which included acquisition (step 1), adaptation (step 2) and assimilation (step 3), and encouraged participants to think about how the region fared on each of the steps.

The Director of the Innovation Division of the World Intellectual Property Organization (WIPO), asked participants to consider whether patent numbers were a good measure of innovation. While there was a high degree of correlation between patent volume and innovation, he encouraged them to think about other forms of innovation as well, for example, in management, business practices and distribution. He said to look at where innovation was actually occurring within the economies and societies of the region. It could be a potentially important line of inquiry for the region, where, although patent development and registration could be improved, innovations in other areas might have greater potential for scaling up. One of the great innovation trends of recent years was that the increase in knowledge sharing worldwide had often been accompanied by increased numbers of multinational or multisectoral patents. He reminded participants that patents not filed in certain countries — as filing in every country would be cost-prohibitive — remained an unexploited form of knowledge transfer. To assist countries in the Arab region in the creation of innovation infrastructure and a larger university-industry collaboration, WIPO had established technology transfer offices in five countries. Drawing on a wide range of partnerships, each office concentrated on country-specific projects while also linking to each other through an Arab region innovation network.

Talal El Makdessi, Chief Executive Officer of the Talal El-Makdessi Foundation in Lebanon, questioned how fully understood ideas about innovation are in the Arab countries of Western Asia. In his experience in Lebanon, the international community played a central role in filling innovation gaps left by the public and private sectors. In particular, the Lebanese diaspora, which included many professionals in engineering and medicine who had relocated to Europe and North America, had played an important role. The innovations propelled by that community were welcome, but it was important to have willing and able local partners in Government and the private sector to ensure that their benefits could be maximized. He expressed scepticism that university research and academia in the region were producing the kind of innovative thinking needed for the future. He concluded by recommending stronger United Nations support directly to civil society and non-governmental organizations.

During the discussion, participants questioned whether business models for science, technology and innovation were sufficiently developed in the region. One participant suggested that social entrepreneurship could be a way forward and could prove to serve as a sort of leapfrogging for science, technology and innovation advances in the region. The Director of the Innovation Division of WIPO responded to those comments by emphasizing that the primary focus of business strategies should be fulfilling local demand and needs with an orientation towards results. With regard to open education resources, some participants questioned what options local researchers and other actors had to add the greatest value using those tools. The Chief of the UNCTAD Science and Technology Section reminded participants that global knowledge and resources were important, but could not be used effectively without the necessary domestic capacities and skills. One participant questioned whether those resources were more important than exposure to networks, which led to the resources necessary for gaining visibility. The UNIDO Strategic

Planning Officer remarked that a network only makes sense, and remains sustainable, when a shared goal is at its centre. He highlighted the Secretary-General's Sustainable Energy for All initiative as a success-in-progress that emerged from business interests, genuine household needs and high-level political concerns about climate change. As a successful example of a network that is serving the region well, one participant highlighted the Arab States Research Education Network.

III. Conclusions and recommendations

The Director of the Information and Communication Technologies Division of ESCWA emphasized the importance of having regional actors commit to taking action on the challenges identified during the meeting, rather than continuing with business as usual.

In his closing remarks, the Director of the Office for Economic and Social Council Support and Coordination noted the energy animating many of the participants' recommendations for the region and highlighted several key messages that were raised during the roundtable discussions. First of all, he referred to the establishment of a regional policy framework on science, technology and innovation as an important first step in making progress towards improved regional cooperation in Western Asia. Second, he noted the concern over inclusive access to knowledge and information provided by new technologies. Regional actors should be thinking about ways, including with partners from outside of the region where possible, to bridge whatever gaps remained in new, open resources which could help to drive innovation in Western Asia. Third, there were too few linkages between research systems and productive sectors in the region. States should consider supporting selected strategic areas, such as water, desertification, renewable energy and public health, as well as applied research for which public authorities promote active collaborations with dynamic firms and social actors.

He noted that several initiatives being discussed by the ESCWA Technology Centre for 2013 and beyond could be of particular relevance to the mandate of the Council. The first would promote technology transfer in the region by connecting major scientific players with local economies. The second initiative aimed to develop intellectual property and commercialization programmes at universities and research centres to promote wider research commercialization initiatives. The third was a series of four workshops ESCWA proposed to hold on green technology for rural development to promote the design and implementation of inclusive sustainable technologies in the region. The fourth would be a series of proof-of-concept workshops in the region, which would support skills development in areas that limited the commercialization of research outcomes. He encouraged Ministers and other participants to remain engaged with the Council until the ministerial review in July 2013 in Geneva, at which Jordan would share with the Council the highlights of the discussion at the annual ministerial review regional meeting.

Recommendations

- **Governments should adopt national innovation strategies and coherent science and technology policies as important first steps to ensure that the necessary policy frameworks include design incentives for the flourishing**

of innovation. For even greater coherence, such policies could also be adopted at the regional level.

- Governments should increase gross expenditure on research and development to demonstrate the national commitment to science, technology and innovation, in line with national sustainable development priorities and strategies to grow sustained scientific research networks.
- Governments and education providers should work together to ensure that, when possible, degree and research programmes are strategically oriented towards addressing future and emerging challenges in high-demand, high-growth sectors while maintaining important basic science education for many dimensions of the sustainable development agenda, including public health literacy and general scientific literacy for problem-solving.
- Financing entities should bear in mind that much of the private sector activity in the region occurs among microenterprises, making it difficult for entrepreneurs to take risks that could result in innovation.
- Local private sector actors and policymakers should take advantage of developments in science, technology and innovation made elsewhere, especially through information and communications technology, to leapfrog the intermediary steps of technological development. They should take into consideration the local absorptive capacities and skills developed in the region.
- Actors in the region should put just as much effort into strengthening intraregional networks as they have into forging partnerships with actors outside the region (in Europe and North America, for example).
- The organizations of the United Nations system and development cooperation providers should consider the great potential of international research collaborations and other international innovation-oriented networks and partnerships to help to deliver on the post-2015 United Nations development agenda.
- To maximize the potential for driving innovation, the United Nations system should consider developing better strategies for directly engaging private sector and civil society actors in science, technology and innovation projects in the region.